REMARKS

I. Introduction

In response to the pending Office Action and Advisory Action, Applicants have incorporated the limitations of claim 2 into claim 1 and cancelled claims 2 and 3, without prejudice. Claim 4 was rewritten in independent format. New claims 8 and 9 have been added. Support for new claims 8 and 9 may be found, for example, on page 21, lines 3-12 of the specification. No new matter has been added.

A Request for Continued Examination (RCE) is being filed concurrently with this Amendment.

For the reasons set forth below, Applicants respectfully submit that all pending claims as currently amended are patentable over the cited prior art.

II. Response to the June 30, 2009 Advisory Action

In the Advisory Action issued June 30, 2009, it is alleged that "claim 1 is broad...as any negative active material can read on claim 1" and accordingly, the showing of unexpected results in Tables 2 and 3, which allegedly only show one negative and positive material, is not commensurate in scope with the degree of protection sought by the claimed subject matter. Then, the Examiner states that unexpected results must be shown for "all negative active materials" or the claims must be narrowed to be commensurate with the showing.

Applicants respectfully disagree. Claim 1 requires that the negative electrode active material comprise a carbon material that is capable of absorbing and desorbing lithium. As such, it does not encompass "all negative electrode active materials". Moreover, Tables 2 and 3 show

11 different positive active materials, and the negative electrode active material is graphite, which contains carbon and absorbs lithium ions. Accordingly, Applicants submit that the claims are commensurate in scope with the specification.

III. The Rejection Of Claims 1-7 Under 35 U.S.C. § 103

Claims 1, 2 and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Inoue (USP 5,707,756); claim 3 as being unpatentable over Inoue in view of Lu et al. (US 2003/0027048); claims 4-5 as being unpatentable over Inoue in view of Shoichiro et al. (JP 2002-319398); and claim 7 as being unpatentable over Inoue in view of Fernandez et al. (USP No. 5,637,413). Applicants respectfully traverse these rejections for at least the following reasons.

With regard to the present disclosure, claim 1 recites, in-part, a non-aqueous electrolyte secondary battery comprising a positive electrode material mixture layer which comprises a positive electrode active material comprising a lithium transition metal composite oxide, wherein the lithium transition metal composite oxide is represented by the general formula (1): $Li_xCo_{1-y}M_yO_2$, the general formula (1) satisfies $1.0 \leq x \leq 1.03$ and $0.005 \leq y \leq 0.15$, the element M in the general formula (1) is at least one selected from the group consisting of Mg, Al, Ti, Sr, Mn, Ni and Ca, an end of charge voltage of the non-aqueous electrolyte secondary battery is set to 4.25 to 4.5 V in normal operation, and the ratio R:Wp/Wn is 1.5 to 2.2 in the area where the positive electrode material mixture layer and the negative electrode material mixture layer are opposed to each other.

One feature of the present disclosure is that the ratio R of the weight of the positive electrode active material to that of the negative electrode active material is adjusted within the

range of 1.5 to 2.2 only in the area where the positive electrode and the negative electrode are opposed to each other. Further, the lithium composite oxide being represented by the general formula (1): $Li_xCo_{1-y}M_yO_2$ is used as the positive electrode active material. That is, a combination of the features of the $Li_xCo_{1-y}M_yO_2$ and the claimed weight ratio improves the charge and discharge cycle characteristics, and in terms of the safety of the battery, an effect of decreasing the thermorunaway temperature is achieved. As a result of these features, a non-aqueous electrolyte secondary battery having very small reduction in discharge capacity over time can be obtained, even when the end of charge voltage is set to 4.25 V or higher. This is shown in Tables 2 and 3 of the specification.

Table 2 shows the combination of the lithium composite oxide $Li_xCo_{1-y}M_yO_2$ and the claimed weight ratio of claim 1 make the capacity maintenance rate as high as 80% (see, Batteries 2-7). In contrast, as shown in Battery 1, when the weight ratio R is lower than 1.3, a decrease in the capacity maintenance rate is observed even with the use of $Li_xCo_{1-y}M_yO_2$. For example, in Battery 1, when the end of charge voltage is set to 4.5 V, the capacity maintenance rate is decreased to 70%. In addition, when R is greater than 2.2, the capacity maintenance rate is 70% or lower (see, Batteries 8 and 9 in Table 2). In addition, even if R is within the claimed range, such as 2.0 or 1.5, when $Li_xCo_{1-y}M_yO_2$ is not used, the capacity maintenance rate is 45% or lower (see, Batteries A and B).

In addition, Table 3 of the present disclosure shows the evaluation results of the thermorunaway temperature. A comparison is made with a charge voltage of 4.4 V. Again, if the two features of the lithium composite oxide and the claimed weight ratio are combined, the thermorunaway does not begin under 170 °C in most of the batteries. In contrast, when R is less than 1.3 or greater than 2.2, the thermorunaway is from 150 to 160 °C even if a different metal is

used. In addition, even if R is within the claimed range, the thermorunaway starts at around 140 °C if a different metal is used in the lithium composite oxide. Thus, it is clear that the two combined features result in unexpected superior results.

Inoue clearly fails to disclose these features. In response to the argument that the claimed range of ratio Wp/Wn shows unexpected results, the Examiner stated that three different "end of charge" voltages were used and each had an effect on the capacity maintenance rate and thermorunaway threshold temperatures. As such, the Examiner alleges that the ratio is not the only results effective variable. Furthermore, the Examiner alleges that the results are not significant because the data overlap each other at the different end of charge voltages. These arguments are without logical merit and it appears that the Examiner may not fully understand why "overcharge voltage" is used in testing batteries. Applicants would point out to the Examiner that the end of charge voltage is *a test of the degree of overcharge at which the battery can perform safely*, not a variable of the battery itself. Moreover, as the data shows, regardless of what end of charge voltage is used, the claimed ratio improves the capacity maintenance rate and thermorunaway threshold temperatures. As such, it is clear that the varying overcharge voltages are not result effective variables, but rather, testing limits. Accordingly, it is clear that claim 1 is not taught or suggested by Inoue.

Moreover, the Examiner also argues that with regard to the argument that Inoue is not specific with regard to the safety characteristic improved by the present disclosure, Applicants are "arguing features not claimed in the claims". However, the argument was not utilized to argue for a claim limitation, but rather to show that the present claims distinguish over the cited prior art in ways not even discussed in the prior art.

In order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. As Inoue, at a minimum, fails to disclose a non-aqueous electrolyte secondary battery comprising a positive electrode material mixture layer which comprises a positive electrode active material comprising a lithium transition metal composite oxide, wherein said lithium transition metal composite oxide is represented by the general formula (1): $Li_xCo_{1-y}M_yO_2$, said general formula (1) satisfies $1.0 \leq x \leq 1.03$ and $0.005 \leq y \leq 0.15$, the element M in said general formula (1) is at least one selected from the group consisting of Mg, Al, Ti, Sr, Mn, Ni and Ca, an end of charge voltage of said non-aqueous electrolyte secondary battery is set to 4.25 to 4.5 V in normal operation, and the ratio R:Wp/Wn is 1.3 to 2.2 in the area where said positive electrode material mixture layer and said negative electrode material mixture layer are opposed to each other, it is submitted Inoue does not render claim 1 obvious. Accordingly, claim 1 is allowable and as such, it is respectfully requested that the § 103 rejection of claim 1, and any pending claims dependent thereon be withdrawn.

Furthermore, as independent claim 4 recites Wp/Wn ratios that are not present in the prior art, Applicants submit that claim 4 is allowable and patentable as well.

IV. All Dependent Claims Are Allowable Because The Independent Claim From Which They Depend Is Allowable

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claim 1 is patentable for the reasons

set forth above, it is respectfully submitted that all pending dependent claims are also in condition for allowance.

V. Conclusion

Having responded to all open issues set forth in the Office Action, it is respectfully submitted that all claims are in condition for allowance.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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